A gas is held behind a partition in an insulated chamber, the other side of the partition is vacuum. The partition breaks involving negligible energy change.
What happened after equilibrium is reached?

	$\Delta U_{internal}$	Q (heat absorbed BY the system)	W (work done BY the system)
1	> 0	0	< 0
2	< 0	0	> 0
3	0	> 0	> 0
4	> 0	> 0	0
5	< 0	> 0	> 0
6	0	< 0	> 0
7	> 0	< 0	< 0
8	< 0	< 0	0
9	0	0	0

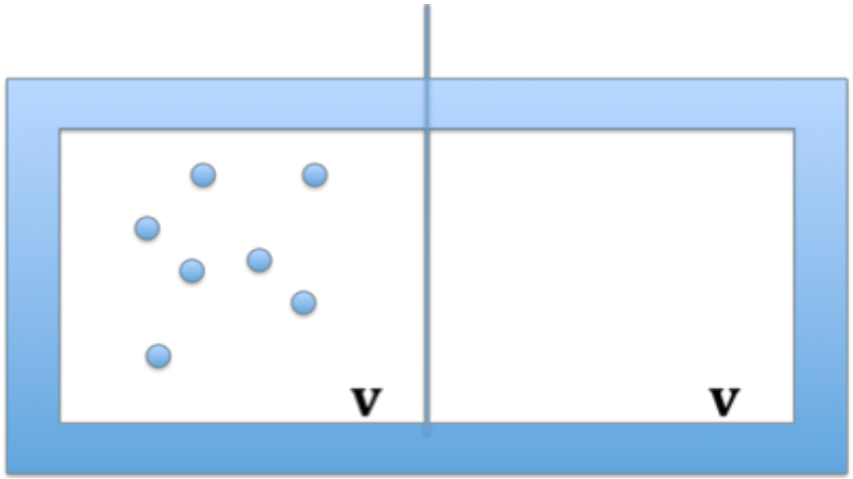
An inflated balloon is placed in a vacuum chamber and some of the air removed. The balloon grows substantially in size. What happened to the energies of the air inside the balloon?

	$\Delta U_{internal}$	Q (heat absorbed BY the system)	W (work done BY the system)
1	> 0	0	< 0
2	< 0	0	> 0
3	0	> 0	> 0
4	> 0	> 0	0
5	< 0	> 0	> 0
6	0	< 0	> 0
7	> 0	< 0	< 0
8	< 0	< 0	0
9	0	0	0

Suppose an isolated box of volume 2V is divided into two equal compartments. An ideal gas occupies half of the container and the other half is empty.

When the partition separating the two halves of the box is removed and the system reaches equilibrium again, how does the new **thermal (internal) energy** of the gas compare to the internal energy of the original system?

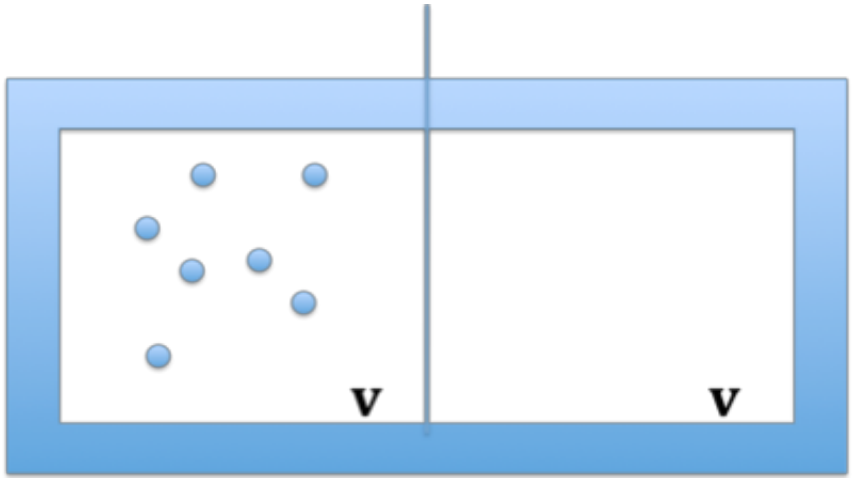
1. The energy increases
2. The energy decreases
3. The energy stays the same
4. There is not enough information to determine the answer

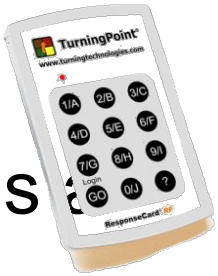


Suppose an isolated box of volume 2V is divided into two equal compartments. An ideal gas occupies half of the container and the other half is empty.

When the partition separating the two halves of the box is removed and the system reaches equilibrium again, how does the new **pressure** of the gas compare to the pressure of the original system?

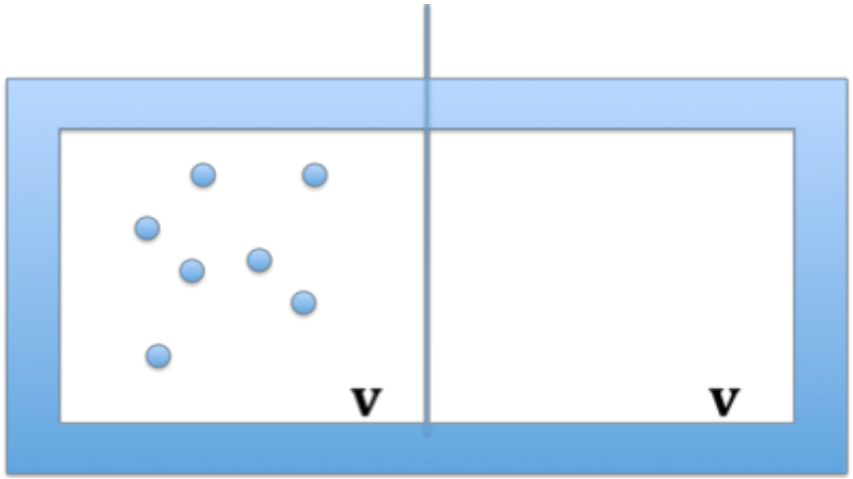
1. The pressure increases
2. The pressure decreases
3. The pressure stays the same
4. There is not enough information to determine the answer





Suppose instead of being a partition that can be easily (without friction) be slid out, the partition is a light piston that is gradually pushed by the gas from the middle to the right wall of the chamber. How does the **thermal (internal) energy** of the gas at the end compare to the energy of the gas at the start?

1. The energy increases
2. The energy decreases
3. The energy stays the same
4. There is not enough information to determine the answer



Suppose an isolated box of volume 2V is divided into two equal compartments. An ideal gas occupies half of the container and the other half is empty.

We are interested in seeing how far the gas will shoot a rubber plug when we release its hook. Will the gas shoot the plug farther if the partition has been removed ?

1. It will shoot farther when the partition is still in.
2. It will shoot farther when the partition has been taken out.
3. It will not matter. It will shoot the same both ways.
4. There is not enough information to decide.